CLAIMS

1. A fluoropolymer containing acid/acid salt groups and having $-CF_2H$ groups at polymer chain terminals, wherein said acid/acid salt groups are sulfonic acid groups, $-SO_2NR^1R^2$, $-SO_3NR^3R^4R^5R^6$, $-SO_3M^1{}_{1/L}$, phosphoric acid groups, $-PO_3(NR^7R^8R^9R^{10})_2$ and/or $-PO_3M^2{}_{2/L}$, in the formula R^1 represents H or $M^6{}_{1/L}$, R^2 represents H, $M^7{}_{1/L}$, an alkyl group or a sulfonyl-containing group, R^3, R^4, R^5, R^6, R^7, R^8, R^9 and R^{10} are the same or different and each represents H or an alkyl group containing 1 to 4 carbon atoms, M^1, M^2, M^6 and M^7 are the same or different and each represents a metal having a valence of L, said metal having a valence of L being a metal belonging to the group 1, 2, 4, 8, 11, 12 or 13 of the long-form periodic table.

2. The fluoropolymer according to Claim 1, said fluoropolymer being one obtained by subjecting a fluoropolymer precursor containing acid/acid salt groups and having $-CF_2COOX$ groups at polymer chain terminals, in the formula X represents H, $NR^{11}R^{12}R^{13}R^{14}$ or $M^4{}_{1/L}$; R^{11}, R^{12}, R^{13} and R^{14} are the same or different and each represents H or an alkyl group containing 1 to 4 carbon atoms and M^4 represents a metal having a valence of L, said metal having a valence of L being as defined above, to heat treatment by which said $-CF_2COOX$ groups can be converted to $-CF_2H$ groups, X being as defined above.

3. The fluoropolymer according to Claim 1 or 2, wherein said acid/acid salt groups are sulfonic acid groups, $-SO_3NR^3R^4R^5R^6$ and/or $-SO_3M^1{}_{1/L}$, R^3, R^4, R^5, R^6 and M^1 being as defined above.

4. The method of producing the fluoropolymer according to any one of Claims 1 to 3, by subjecting a

fluoropolymer precursor containing acid/acid salt groups and having $-CF_2COOX$ groups at polymer chain terminals, in the formula X represents H, $NR^{11}R^{12}R^{13}R^{14}$ or $M^4_{1/L}$; R^{11}, R^{12}, R^{13} and R^{14} are the same or different and each represents H or an alkyl group containing 1 to 4 carbon atoms and M^4 represents a metal having a valence of L, said metal having a valence of L being a metal belonging to the group 1, 2, 4, 8, 11, 12 or 13 of the long-form periodic table, to heat treatment for the conversion of said $-CF_2COOX$ groups to $-CF_2H$ groups, X being as defined above,

wherein said fluoropolymer precursor is one obtained by polymerizing a perhalovinyl ether derivative represented by the general formula (I):

$$CF_2=CF-O-(CF_2CFY^1-O)_n-(CFY^2)_m-SO_2Z \qquad (I)$$

wherein Y^1 represents F, Cl or a perfluoroalkyl group, n represents an integer of 0 to 3, the n atoms/groups of Y^1 are the same or different, Y^2 represents F or Cl, m represents an integer of 1 to 5, the m atoms of Y^2 are the same or different and Z represents F, Cl, Br, I, $-OM^5_{1/L}$ or $-ONR^{15}R^{16}R^{17}R^{18}$; M^5 represents a metal having a valence of L and the metal having a valence of L is as defined above, and R^{15}, R^{16}, R^{17} and R^{18} are the same or different and each represents H or an alkyl group containing 1 to 4 carbon atoms,

when the group $-SO_2Z$ in the general formula (I) is not said acid/acid salt group but is a group convertible to such acid/acid salt group, said fluoropolymer precursor is one subjected to a conversion treatment, after the above-mentioned polymerization, for the conversion of said group $-SO_2Z$ to the above-mentioned acid/acid salt group, and

said heat treatment comprises heating said fluoropolymer precursor at 120 to 400°C.

5. The method of producing a fluoropolymer according to Claim 4,

wherein the heat treatment comprises heating the fluoropolymer precursor at 120 to 200°C in the presence of water or an organic solvent having compatibility with water.

6. The method of producing a fluoropolymer according to Claim 5,

wherein the organic solvent having compatibility with water is an organic liquid having a boiling point exceeding 100°C but not exceeding 300°C.

7. The method of producing a fluoropolymer according to any one of Claims 4 to 6,

wherein the fluoropolymer precursor is an at least binary copolymer obtained by polymerizing the perhalovinyl ether derivative and a monomer copolymerizable with said perhalovinyl ether derivative.

8. The method of producing a fluoropolymer according to any one of Claims 4 to 7,

wherein Y^2 is F, n is 0 or 1 and m is 2 or 3.

9. The method of producing a fluoropolymer according to any one of Claims 4 to 8,

wherein the fluoropolymer precursor constitutes a powder, dispersion, solution or membrane-shaped molding.

10. The method of producing a fluoropolymer according to Claim 9,

wherein the fluoropolymer precursor constitutes a membrane-shaped molding.

11. An electrolyte membrane comprising the fluoropolymer according to any one of Claims 1 to 3.

12. An immobilized active substance material

comprising the fluoropolymer according to any one of Claims 1 to 3 and an active substance.

13. The immobilized active substance material according to Claim 12,
wherein the active substance is a catalyst.

14. The immobilized active substance material according to Claim 13,
wherein the catalyst is a platinum-containing metal.

15. A membrane-electrode assembly comprising the immobilized active substance material according to Claim 13 or 14.

16. A solid polymer electrolyte fuel cell comprising the membrane-electrode assembly according to Claim 15.

17. A solid polymer electrolyte fuel cell comprising the electrolyte membrane according to Claim 11.